DOCUMENT RESUME

ED 210 832 EC 140 632

AUTHOR Bryant, N. Dale; And Others
TITLE Applying the Mastery Model to Sight Word Instruction for Disabled Readers. Technical Report # 2.
INSTITUTION Columbia Univ., New York, N.Y. Research Inst. for the Study of Learning Disabilities.
SPONS AGENCY Office of Special Education (ED), Washington, D.C.
PUB DATE 80
CONTRACT 300-77-0491
NOTE 22p.

EDRS PRICE MF01/PC01 Plus postage.
DESCRIPTORS Elementary Education; *Learning Disabilities; *Mastery Learning; *Reading Difficulties; *Sight Vocabulary; Teaching Methods

ABSTRACT

The study involving 32 learning disabled elementary school students evaluated the effect of applying a mastery learning model to sight word instruction. Ss were taught 30 sight words in nine lessons over a period of 3 weeks. Lessons incorporated the following remedial principles: limiting the size of the teaching unit, giving discrimination training, providing adequate practice and review, and utilizing a variety of contexts to insure transfer. Posttest performance, at the end of the 3 weeks, indicated that 84% of the sample was able to attain 80% or better accuracy on lists or sentences containing the 30 words. Results of the investigation suggested that a majority of learning disabled children can reach mastery on sight words within a reasonable time framework if instruction incorporates important remedial principles. (Author/SB)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

RESEARCH INSTITUTE FOR THE STUDY OF LEARNING DISABILITIES
Teachers College, Columbia University

ED210832

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

This document has been reproduced as received from the person or organization originating it.
Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

APPLYING THE MASTERY MODEL TO SIGHT WORD INSTRUCTION FOR DISABLED READERS

N. Dale Bryant, Harriet R. Fayne, and Maribeth Gettinger

EC 140632

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Diane Brandt
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Technical Report #2

1980

The Research Institute for the Study of Learning Disabilities at Teachers College, Columbia University is supported by a contract (300-77-0491) with the Office of Special Education, Department of Education through Title VI-G of Public Law 91-230.

The Research Institute is predicated on the assumption that many of the problems exhibited by learning disabled children arise because of difficulties they manifest in information-processing. The overall goals of the Institute are to investigate the nature of such information-processing difficulties and, on the basis of the findings of these investigations, to develop effective and efficient instruction for children with learning disabilities.

The Institute is composed of five independent task forces that focus on specific academic skill areas fundamental to the school curriculum: basic reading and spelling, reading comprehension, arithmetic, and study skills. All of the task forces are dedicated to the identification of specific disabilities in these skill areas and to the development of effective remedial instruction.

Principal Investigators

N. Dale Bryant, Ph.D.
Jeannette Fleischner, Ed.D.
Walter MacGinitie, Ph.D.
Margaret Jo Shepherd, Ed.D.
Joanna Williams, Ph.D.

Institute Director

Frances P. Connor, Ed.D.

Additional information on research activities of the Institute may be obtained by writing:

Research Institute for the Study of Learning Disabilities
Box 118
Teachers College, Columbia University
New York, N. Y. 10027

RESEARCH INSTITUTE FOR THE STUDY OF LEARNING DISABILITIES
Teachers College, Columbia University

APPLYING THE MASTERY MODEL TO SIGHT WORD INSTRUCTION FOR DISABLED READERS

N. Dale Bryant, Harriet R. Fayne, and Maribeth Gettinger

Technical Report #2

1980

Acknowledgements

The authors wish to thank the following people for their assistance in data collection: Susan Abranams, Carol Johnson, Mary Kelly, Richard Krause, Joanne Sacks, and Charles Turecek.

Abstract

The present study evaluated the effect of applying a mastery learning model to sight word instruction for learning disabled, elementary-school youngsters. Thirty-two children, drawn from diagnostic classrooms and clinics, were taught 30 sight words in nine lessons over a period of three weeks. Lessons incorporated the following remedial principles: limiting the size of the teaching unit, giving discrimination training, providing adequate practice and review, and utilizing a variety of contexts to insure transfer. Posttest performance, at the end of the three weeks, indicated that 84% of the sample was able to attain 80% or better accuracy on lists or sentences containing the 30 words. Results of this investigation suggest that a majority of LD children can reach mastery on sight words within a reasonable time framework if instruction incorporates important remedial principles.

Applying the Mastery Learning Model to Sight Word Instruction for Disabled Readers

The mastery learning instructional model (Bloom, 1968) proposes that a majority of children may be able to achieve the same amount of learning (i.e., master the same material) if two conditions are met. First, each learner must be given sufficient time to master each learning step in an instructional sequence. Second, children must be given the appropriate help and feedback in order to correct and rework the learning steps until each is mastered. The goal of mastery learning strategies is to fix achievement for a group at some constant mastery level and manipulate instruction (such as the amount of repetition, feedback, or correction) so that all pupils attain it. Thus, the essence of mastery learning strategies, stated by Bloom (1977), is "group instruction supplemented by frequent feedback and individualized help as each student needs it." (p. 24) Bloom's approach incorporates what is essentially teacher-directed group instruction; it is the amount of practice and feedback that is individualized.

Although the elements of the mastery learning model are not new, it is only in recent years that effective strategies and programs labeled mastery learning have been developed and researched. According to Block (1971), mastery learning procedures share many features: specification of instructional objectives; well-defined learning tasks; complete mastery of one task before going on to another; absolute or criterion-referenced evaluation to determine mastery; and repeated

instruction until mastery is achieved. Since the goal of mastery learning is for learners to reach a specified criterion level of performance, this last feature--recycling or giving repeated opportunities for children to attain satisfactory performance--is a crucial one, particularly for slow learners.

The efficacy of mastery learning strategies appears to be well-documented for different age groups of normal learners (Block, 1971; Burrows & Okey, 1975; Glaser, 1968; Katims, 1977; Lawler, Dick, & Riser, 1974; Suppes, 1964). There has been less research, however, on mastery learning interventions with learning disabled children. In a critical review of mastery learning theory, Mueller (1976) suggested that mastery learning's optimal usefulness might be specifically in teaching basic skills at the elementary grade level, especially to slow learners or those who do not learn independently. Since the model hypothesized a reduction in failure, Mueller stated that mastery learning would be an effective model to use with educationally disadvantaged children at all grade levels. One reason that mastery learning procedures may be particularly appropriate for slow learners or learning disabled children is that these strategies are intended to allow for equal levels of performance from learners, regardless of children's entering abilities, or what Bloom (1968) calls cognitive entry behaviors. In fact, many learning disabilities specialists and researchers (Bryant, 1965; Haring & Bateman, 1977; Johnson & Myklebust, 1967) agree that instruction for disabled youngsters needs to be systematic and incorporate many of the features that are inherent in mastery learning strategies.

Variation in time to learn between children with high and low entry behaviors poses one of the major problems in incorporating mastery learning theory into group instruction, particularly for learning disabled children who, although consistently low in achievement, may exhibit wide ranges in ability or prerequisite knowledge. Although group instruction may not be as desirable for handicapped learners as individual, tutorial instruction, few educational settings for learning disabled children have the means to provide individual tutoring.

The major goal of the present research was to develop and document the effectiveness of group experimental procedures designed to be efficient in accomplishing mastery in sight word reading within reasonable time limits for learning disabled children. Specifically, the research sought to answer the question: What are the initial and cumulative effects of mastery sight word procedures on the achievement of learning disabled children?

Method

Subjects

A total of 32 children (26 boys and 6 girls) who had been diagnosed as learning disabled were selected from populations of elementary school children enrolled in diagnostic-remedial classes in New York City public schools or in remedial reading classes conducted at two psychoeducational clinics in New York City. Children had been categorized as learning disabled by school or clinic personnel because of discrepancies between intellectual functioning and reading achievement. No child

with primary sensory, emotional, or neurological difficulties was included in the sample.

The following criteria were used to select children for the study: (a) Teachers or clinicians selected those children who they felt had poor sight word vocabularies. (b) On pretests, children demonstrated a lack of knowledge of the specific words to be taught.

The sample of children had a mean chronological age of 121 months (SD = 20; range = 86-162), a mean Full Scale IQ (Wechsler Intelligence Scale for Children--Revised) of 87 (SD = 11; range = 70-119), and a mean word recognition grade equivalent (Wide Range Achievement Test--Reading subtest) of 2.2 (SD = 1; range = 1.0-3.5). Children were drawn from populations that represented predominantly lower socio-economic levels and black or hispanic ethnic backgrounds.

Procedure

In order to facilitate mastery learning, the following instructional procedures were used: Teaching in 5-word units; dropping words temporarily as they are learned; providing distributed practice across days; giving specific discrimination training; and, training for transfer. Lessons were constructed to provide all children with an opportunity to achieve mastery of: (a) thirty sight words in list presentation; (b) discrimination of these words from visually similar miscue words; and (c) reading of these words in sentences and stories consisting of the thirty words.

All children received nine 30-minute periods of instruction. The children were taught in groups of two to five on three different days each week for three consecutive weeks. The lessons were conducted by

six experimental teachers who were graduate students in special education or reading. All teachers received training which included careful reading of lesson scripts, familiarization with teaching materials, and simulated activities for each part of the lessons. In addition, each teacher was observed during an instructional period to insure that procedures were carried out according to the prescribed scripts.

Instructional objectives. The first step in applying the mastery learning model to sight word instruction was the specification of objectives and definition of the corresponding learning tasks to be mastered. Ten different words were taught during each week. Mastery of a week's words was defined as reaching criterion (a fixed achievement level of one correct trial) on each of the following: (a) reading each training word correctly in two five-word lists; (b) reading each training word correctly in one combined ten-word list; (c) rejecting twenty nonsense miscue words (two per training word) that differed by either a middle or final letter from the training words; (d) reading at least two phrases and sentences containing the training words; and, (e) reading one short story containing all ten words.

Summary of mastery lesson format. Each week of instruction was the same, except that a different set of ten words was taught each week. The order of presentation of words within a week remained constant, but the order of presentation for specific sets of words was counterbalanced across instructional groups. In the first lesson, children received introductory activities on five of the ten words to be taught, followed by mastery practice. The components of mastery practice were

essentially the same across all days of instruction: Children read the words from individual cards while the teacher recorded the number of trials needed by each child to reach criterion on all words on a separate recording sheet. Whenever a child made an error, the teacher recorded an incorrect trial and gave the correct response; the child immediately repeated the word. All pupils were able to reach criterion (i.e., one correct trial per word) within five trials. Only misread words were recycled for children until each was mastered. Once a word was read correctly, it was dropped from that particular child's list. Children in a group who reached criterion on all words within a minimum number of trials remained actively involved in the lesson through choral responding (after another child read a word correctly). Introductory activities and mastery practice were given in a similar fashion for the second five words. The two five-word units were then combined and practiced to mastery using the total set of ten words. Discrimination training was also provided during the first lesson. Children were shown training words mixed with miscue words in which either a middle or final letter was changed; they were instructed to read each real training word and reject (say "no" to) each nonsense miscue word.

The second lesson began with a review of the ten training words followed by phrase and sentence reading practice in which children read first one-word, and then two-word and three-word phrases, and eventually sentences containing the ten training words.
Children then practiced at least two sentences (containing four different training words) until they read them accurately. In lesson three,

children received both silent and oral reading practice as well as comprehension exercises on a short story incorporating all ten words.

Instruction during Week's Two and Three also included cumulative practice on all previous weeks' words in list presentation and in sentences.

Materials. The ten training words for each week were selected to meet the following criteria: (1) they were not likely to be in a child's sight word repertoire; (2) they were likely to be in a child's speaking vocabulary; and, (3) they were grouped according to one central theme so that they could be incorporated into a meaningful short story. Sixty different nonsense miscue words (two per training word) were also used during training. The specific training words and examples of miscue words are shown in Table 1.

Table 1

Training Words and Examples of Miscue Words Used During Instruction

Set A		Set B		Set C	
Training Words	Miscue Words	Training Words	Miscue Words	Training Words	Miscue Words
Winnie	Winsie	Barbara	Barbaru	Albert	Alberh
pigeon	pigeov	scarf	scirf	point	pajnt
soldier	soltier	jacket	jackeh	ceiling	ceilinp
touch	toucd	cashier	castier	Elisabeth	Elimabeth
Willie	Wiltie	argue	arguo	mosquito	mosquiti
cereal	cereab	Bertha	Berlha	mark	mack
shovel	shomel	sweater	sweatem	ladder	laddec
recipe	recipu	blouse	blonse	shoves	shives
calm	cakm	collar	collas	cough	cougd
suggest	suggasl	sleeves	sleoves	ruins	ruons

Measurement. An individually-administered test was given one day prior to instruction as a pretest and one day after training as a posttest. It consisted of the thirty sight words in list presentation and in sentences.

Children were also given individual, criterion-referenced tests at the end of each week of instruction. Each weekly test consisted of the ten training words for the week and ten miscue words.

In order to assess a child's learning rate on the material presented in the lessons, the number of trials needed to reach criterion on items was tabulated. Two learning rate measures were computed by summing the number of trials needed to read each word correctly one time in a 5-word grouping (5-word trials score) and in a 10-word grouping (10-word trials score).

Results

Children made significant gains from pretest to posttest in their ability to read words in list presentation and in the context of sentences. Table 2 summarizes the pretest and posttest performance of the group. The average number of words read correctly in list format increased significantly from 2.2 (7%) out of 30 on the pretest to 26.9 (90%) on the posttest, t (31) = 33.70, $p < .001$. Similarly, the number of words read correctly in sentences increased from 1.4 (5%) on the pretest to 26.7 (89%) on the posttest, t (31) = 30.42, $p < .001$. Children needed, on the average, 35.1 trials (SD = 5.2) to read all words correctly one time in a 5-word grouping and 36.8 trials (SD = 6.6) to read them correctly in a 10-word grouping.

Table 2

Means and Standard Deviations of Words Read Correctly on Pretest and Posttest

		Pretest			Posttest			
Measure	Possible Range	$\bar{X}$	SD	%	$\bar{X}$	SD	%	Gain
Words in list presentation	0-30	2.2	(3.0)	7%	26.9	(4.6)	90%	24.7*
Words in sentences	0-30	1.4	(3.6)	5%	26.7	(4.5)	89%	25.3*

*Gains are significant at the .001 level.

Note. N = 32.

Of the entire group of children, 27 (84%) had 80% accuracy on the posttest. It is interesting to note that 25 children (78%) had 90% accuracy and 10 children (33.3%) had 100% accuracy on the posttest. Thus, the mastery learning strategies were successful in bringing the majority of children to an 80% or better criterion level on sight word and sentence reading at the end of three weeks of instruction.

A summary of the group's mean weekly posttest performance, presented in Table 3, indicates that the children retained, on the average, between 85% and 90% of the words taught each week. The number of correct discriminations made (i.e., correct rejections of miscues) was between 75% and 80% each week. The weekly instruction was, therefore, effective in teaching disabled readers to both read and discriminate sight words at a high level of accuracy.

Table 3

Average Weekly Performance on Sight Word Reading and Discrimination

	Words			Discrimination		
Word Set	$\bar{X}$	SD	%	$\bar{X}$	SD	%
Set A	8.7	(1.9)	87%	8.0	(1.6)	80%
Set B	8.6	(2.0)	86%	7.5	(1.9)	75%
Set C	8.5	(1.7)	85%	7.8	(1.9)	78%

Note. N = 32.

Possible range for all $\bar{X}$'s is 0-10.

Five of the children (16% of the total group) retained only 60% of the words taught. Two factors, in particular, appear to differentiate these children from the total group. The first is the 10-word trials score, or the total number of trials needed to read each word correctly in a 10-word list. For each child this score fell more than one standard deviation above the mean of the entire group. The second measure is the average number of words read correctly on the three weekly tests. For each of these children, this scorewas more than one standard deviation below the group mean. Although these children received additional practice to criterion on words they read incorrectly on weekly tests, their final posttest performance still fell below 80% accuracy. Significant correlations were obtained between the trials score and posttest performance (r = -.72) and between the weekly test scores and posttest performance (r = .88). These correlations suggest that children who need more than the average number of attempts to read each word correctly in a 10-word unit and who perform below criterion level on weekly measures are most likely to obtain lower overall posttest scores.

In summary, all 32 children were able to learn the 30 sight words and only 16% had difficulty retaining them. Children were able to read words in lists or sentences with an equal degree of proficiency.

Discussion

The present investigation documented the effectiveness of applying the mastery learning model to sight word instruction for groups of learning disabled children. One conclusion, based on research findings from previous mastery learning interventions, is that mastery learning strategies enable at least 80% of all students to reach a high level of final achievement. On the basis of the present findings, this conclusion can be extended to disabled children; 84% of the learning disabled youngsters in the present study attained at least an 80% accuracy level on 30 sight words after a 9-day instructional sequence that incorporated mastery learning strategies.

Mastery learning advocates concede that, even with efficient instructional procedures that teach for mastery, some students (at worst 20%) will not attain a specified criterion level. Five children (16%) in the present study had less than 80% accuracy on the posttest. For these children, the mastery learning model may still have educational advantages over other instructional models; what may be necessary are further instructional refinements rather than abandonment of the model. For example, for some children, it may be sufficient to modify instruction by teaching the same number of words in smaller units or by providing more repetition or trials per word. In some instances, instructional objectives may need to be modified to match the ability of the learner, such as teaching fewer words each week, teaching easier words, or lowering achievement expectations. It is possible that some children may even require a different, more engaging instructional

mode. For example, multi-sensory techniques or audio-visual materials might be appropriate additions to instruction.

Further research is needed to determine whether or not these few children with inadequate retention can be expected to reach a higher level of accuracy on sight word reading tasks. The effectiveness of some of the modifications suggested above needs to be tested within an experimental framework. The instructional procedures described not only serve as a model of efficient instruction for learning disabled youngsters, they also provide diagnostic information about learners than can help teachers prescribe the most appropriate and most optimal teaching.

In summary, the present study indicated that the application of mastery learning strategies to sight word instruction for learning disabled children is effective in bringing the majority of children to a high criterion level (80%) within reasonable instructional time. Resource room teachers or specialists who work with LD children in small groups are often faced with the problem of providing reading instruction to all children within a 40 or 50 minute period, which is not sufficient time to allow them to teach individually. For these teachers, mastery learning strategies, such as those outlined in this paper, constitute an effective procedure for teaching basic sight word reading skills to learning disabled children.

References

Block, J. H. (Ed.). Mastery learning: Theory and practice. New York: Holt, Rinehart, and Winston, 1971.

Bloom, B. S. Learning for mastery. UCLA-CSEIP Evaluation Comment, 1968, 1 (2). (ERIC Document Reproduction Service No. ED 053 419)

Bloom, B. S. Favorable learning conditions for all. Teacher, 1977, 95, 22-28.

Burrows, C. K. & Okey, J. R. The effects of a mastery learning strategy on achievement. Paper presented at the annual meeting of the American Educational Research Association, Washington, D. C., April, 1975. (ERIC Document Reproduction Service No. ED 109 240)

Bryant, N. D. Characteristics of dyslexia and their remedial implications. Exceptional Children, 1965, 31, 195-199.

Glaser, R. Adapting the elementary school curriculum to individual performance. In Proceedings of the 1967 Invitational Conference on Testing Problems. Princeton, N. J.: Educational Testing Service, 1968.

Haring, N. G. & Bateman, B. Teaching the learning disabled child. Englewood Cliffs, N. J.: Prentice-Hall, 1977.

Johnson, D. & Myklebust, H. Learning disabilities: Educational principles and practices. New York: Grune and Stratton, 1967.

Katims, C. The Chicago Mastery Learning Reading Program: An interim evaluation. Paper presented at the annual meeting of the American Educational Research Association, New York, April, 1977. (ERIC Document Reproduction Service No. ED 137 737)

Lawler, M. R., Dick, W., & Riser, M. Mastery learning and remedial prescriptions in computer-managed instruction. Journal of Experimental Education, 1974, 43, 45-52.

Mueller, D. J. Mastery learning: Partly boon, partly boon-doggle. Teachers College Record, 1976, 78, 41-52.

Suppes, P. Modern learning theory and the elementary school curriculum. American Educational Research Journal, 1964, 1, 70-93.